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AUTHOR Athanasou, James A.
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ABSTRACT

This study explored the effects of sex on responses to 247 items in the "Choice of Occupation Form" among a sample of 500 junior high school students in Australia. It was argued that there was substantial interaction between the types of work chosen (i.e., contact with people versus things and sex in the most frequently and infrequently liked occupations). The greatest differences in occupational choices were in males' orientation towards activities and occupations commonly classified as realistic, mechanical, or technical and females' preferences for social or personal contact occupations. Results suggest caution in the use of the Choice of Occupation Form, since recommendations and inferences about interests made on the basis of occupational choices, either from guidance interviews or from standardized tests, may be clearly sex-restrictive. Use of the sex-balanced items identified in the study may broaden choice options and ensure that vocational interests reflect a fundamental orientation towards things-people or data-ideas, rather than sex stereotypes of the effect of dominant forces in the society. (Author/KC)

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Research Report

INTERACTIONS OF WORK-TASK DIMENSIONS AND SEX DIFFERENCES IN OCCUPATIONAL CHOICES.

James A. Athanasou

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Central Planning and Research Unit, Division of Vocational Guidance Services, Department of Industrial Relations and Technology, N.S.W.
September, 1979

RESEARCH REPORT

INTERACTIONS OF WORK-TASK DIMENSIONS AND SEX-DIFFERENCES IN OCCUPATIONAL CHOICES.

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Abstract

This study explored the effects of sex on responses to 247 items in the "Choice of Occupation Form" among a sample of 500 junior high school students. It was argued that there was substantial interaction between the types of work chosen (i.e. contact with people vs things) and sex. To remove some of the effects of sex stereotypes and thereby increase vocational potential, 'sex-balanced' items were identified. The results suggest caution in the use of the Choice of Occupation Form.

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INTERACTIONS OF WORK-TASK DIMENSIONS AND SEX DIFFERENCES IN OCCUPATIONAL CHOICES.

Foremost among recent issues in the measurement and reporting of interests is concern with the effects of sex differences (Osipow, 1975). Established sex stereotypes in career choices have implications for interest measurement and vocational guidance (Prediger & Hanson, 1978). The most obvious consequence is for the range of career plans and information made available to male or female clients on the basis of their own occupational choices (Prediger & Hanson 1974, 1976d). Currently a great deal of controversy (Holland 1975, 1976; Prediger & Hanson 1976 a,b) has raged around the extent to which inferences and deductions can be made from stated or inventoried vocational choices.

Reviewing the literature on sex-stereotyping, Osipow (1975, p.130) commented that despite continuing changes towards equal opportunity, "sex-role stereotyping of careers remains alive and well." Campbell (1974) investigated male and female differences and similarities in item preferences - men and women - in - general, men and women in the same occupation, as well as boys and girls all have large item preferences differences. Furthermore, sex-stereotyping of occupations has been reported in nationwide studies (Prediger, Roth & Noeth, 1974; Gottfredson, Holland & Gottfredson, 1974); among college students (Shinar, 1975); sixth grade and kindergarten children (Walker, Shlomi & Zimont, 1976); as well as specific groups such as counselling clients (Schlossberg & Goodwin, 1972), or adult women established in full-time employment (Pratt, 1975).

Many researchers have demonstrated that not only is sex related to occupational choice, but that women are more interested in person-oriented occupations (e.g. Carter & Strong, 1933; Hall, 1969; Olive, 1973). Marini and Greenberger (1978, p.148) recently commented on differences in the popularity of various occupations - "Boys' and girls' career choices rarely overlap since girls aspire to a small number of typically "female" occupations, such as teaching, social work, nursing and secretarial work, while boys choose a wide variety of professional or scientific occupations."

Australian studies have also confirmed sex differences in occupational choices (e.g. Connell et al.,1975). Sinclair, Crouch and Miller (1977) studied a cross-section of 876 Sydney students in years 6-12 and reported that girls' aspirations centred around three person-oriented occupational types (i) personal service (e.g. doctor, nurse, medical workers, dentist etc.), (ii) social service (teacher, social worker, lawyer, psychologist, librarian etc.) and (iii) white collar occupations

(secretarial, clerical, sales etc.).

An orientation to "people" or "things" has been widely recognised in the literature on interest measurement (Thurstone, 1931; Strong, 1943; Roe, 1957). Evidence suggests that this interest motivation dimension may be the basic one along which occupations are differentiated: for example, it is a common feature of the analysis of interest scales (e.g. Cottle, 1950). This same dimension was reported in Sweet's (1974) analysis of the occupational choices of 275 year 10 male school leavers: "Occupations entered by males after 4th form differ primarily in terms of a bipolar technological versus non-technological dimension." (p.9).

The present study was aimed at an exploration of how certain occupations are perceived by males and females. Subjects were asked to rate a broad spectrum of 247 occupational titles in terms of like, dislike or uncertainty. The purpose of the investigation was simply to determine (i) the extent of differences as they exist among a sample of Australian high-school students, and (ii) items which are sex-balanced, that is, elicit a similar response from men and women (Prediger & Hanson, 1976).

One important feature of the list of occupations generated by this study is that the list can be related to a theory of work-tasks (Prediger, 1976), and as such, presents a theoretical continuum of occupational fields rather than a random assignment of occupational titles. Sex differences in choice of occupation were examined in relation to Prediger's (1976) work-task dimensions of people vs things and data vs ideas. (See Fig 1).

Method

The sample consisted of 500 high school students (year 8-10) who had applied to participate in a standard vocational guidance programme. Equal numbers of males and females from both urban and rural centres were utilised. S's were also selected in terms of ability (< 85 I.Q. n=54; 85-99 I.Q. n=70; 100-114 I.Q. n=70; >115 I.Q. n=56).

Subjects were asked to indicate their preferences for 247 occupational titles contained in a "Choice of Occupation"[1] form, which was administered prior to guidance interviews. The distribution of work-task dimensions among the 247 occupations was as follows: Things (n=100), Ideas (n=71), People (n=31), Data-People (n=25), Data (n=20). The proportion of males and females indicating preferences for each occupation were determined and the significance of the difference between these independent proportions tested (Ferguson, 1976 p. 174). Differences between males and females in their pattern of preferences for occupations classified according to work-task dimensions were examined in a 2 x 5 ANOVA. The method of unweighted means (Winer 1962) was used to adjust for unequal numbers in the subclasses.

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[1] Data for this research was gathered by R. Sweet, who also constructed the "Choice of Occupation" form.

Results

(i) Frequently liked occupations

The proportion of males and females indicating their preference for an occupation is indicated in Table 1 as a percentage value.

Insert Tables 1, 2 about here

Table 2 indicates these occupations most frequently (30%) chosen and those entirely rejected (0%) in the group. For this analysis only positive 'Yes' responses to an occupation were categorised as 'Like'. With the exception of 'High School Teacher' there is no overlap in occupational choices.

(ii) Sex differences in occupational choice

Significant differences ($p < 0.05$) between male and female preferences occurred across 138 items (i.e. 56% of occupational choices). The extent of statistical differences is also indicated in Table 1.

Items (19.4%) which elicited similar responses (i.e. not statistically different) from men and women are indicated in Table 3. Only those items which were preferred by at least 10% of males or females are listed in terms of the principal work-task dimensions. (These were classified into the work-task dimensions on the basis of the Dictionary of Occupational Titles codes).

Insert Table 3 about here

(iii) Interaction of Sex and Preference for Work-Task Dimensions

Comparison of male and female occupational choices across work-task dimensions are shown below (Table 4).

Insert Tables 4,5 about here

Results of the analysis of variance are summarised in Table 5. There was no overall sex difference ($F(1,484) = 2.73$ n.s. at $= .05$). In occupational preferences, however, there were systematic differences in the interaction of sex and work-task dimensions ($F(4,484) = 13.89$ $p < .01$). As well, there were significant differences across the work-task categories ($F(4,484) = 12.87$ $p < .01$).

Conclusions

Results of this study of Australian students' occupational choices are clearly consistent with those of earlier studies, with different populations. Substantial, systematic and stereotypic differences were evident in male and female occupational choices across work-tasks. Highly divergent preferences for different types of work i.e. "things vs persons" are readily apparent in the most frequently and infrequently liked occupations. The greatest differences in occupational choices were in males' orientation towards activities and occupations commonly classified as realistic, mechanical, or technical and females' preferences for social or personal contact occupations.

Results suggest that users of the Self-Directed Search (Holland, 1970), Tyler Vocational Card Sort (Dolliver, 1967) or Choice of Occupational Form (Division of Vocational Guidance Services) would find that many more men than women would likely be referred to scientific and technical occupations, while many more women than men would be referred to social service and artistic occupations. Thus, recommendations and inferences about interests made on the basis of occupational choices, either from guidance interviews or standardised tests, may be clearly sex-restrictive (Prediger & Hanson, 1978).

The theory and practice of vocational psychology (viz. job information, tests and vocational counselling) have been criticised for discriminatory treatment of males and females (Sweet, 1973). However, the issue of sex-restrictiveness is many-sided (Holland, 1976) and occupational psychologists need to be aware of the extent to which the clients themselves reflect sex stereotypes in their own occupational choices.

Use of the sex-balanced items identified may broaden choice options and ensure that vocational interests reflect a fundamental orientation towards things-people or data-ideas, rather than sex-stereotypes or the effect of dominant forces in our society.

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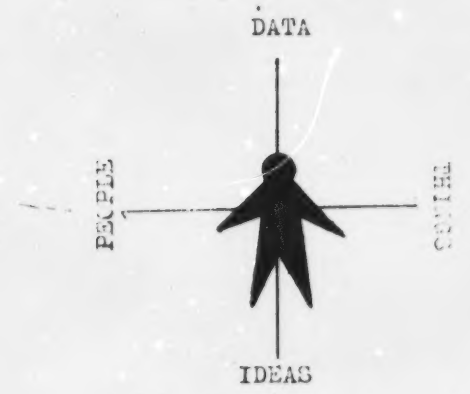
Figure 1

ACT - OCS WORK-TASK DIMENSIONS



WORK TASK PREFERENCES	KUDER PREFERENCE RECORD SCALES MOST RELEVANT TO WORK-TASK PREFERENCES
Data	Computational, Clerical
Data-People	Persuasive
People	Social Service
Ideas	Artistic, Literary, Musical, Scientific
Things	Outdoor, Mechanical

Source: Prediger 1976 (p.207)

TABLE 1

COMPARISON OF MALE AND FEMALE OCCUPATIONAL PREFERENCES (n=500)

OCCUPATIONS	PERCENT "LIKES"		
	M	F	
Electrical engineer	41	2	***
Mechanical engineer	39	3	***
Civil engineer	39	4	***
Chemical engineer	16	4	***
Structural engineer	22	3	***
Electronic engineer	24	3	***
Aeronautical engineer	31	3	***
Industrial engineer	22	3	***
Mining engineer	21	2	***
Surveyor	41	7	***
Architect	37	19	***
Builder	20	6	***
Quantity surveyor	13	2	***
Naval architect	10	3	***
Metallurgist	20	2	***

OCCUPATIONS	PERCENT "LIKES"		
	M	F	
Mathematician	24	10	***
Statistician	20	11	*
Physicist	13	5	**
Chemist	17	16	
Biochemist	19	21	
Geologist	24	13	*
Biologist	27	32	
Botanist	12	17	
Zoologist	25	21	
Ecologist	28	20	
Veterinary scientist	24	20	
Agricultural scientist	19	12	
Food technologist	15	26	**
Textile technologist	4	13	**
Wool technologist	7	11	

***$p<0.001$
**$p<0.01$
*$p<0.05$

OCCUPATIONS	PERCENT "LIKES"		
	M	F	
Bulldozer driver	7	1	**
Cleaner	0	1	
Carpet layer	2	1	
Packer	2	1	
Assembler	3	1	
Bus driver	4	6	
Waiter/waitress	6	12	**
Policeman/policewoman	11	16	
Upholsterer	3	3	
Glazier	3	4	
Bookbinder	1	4	*
Printer	5	4	
Draftsman's tracer	9	7	
Tailor	3	7	
Hairdresser	2	18	***
Pastrycook	6	11	
Cook	14	19	
Baker	14	9	*
Butcher	1	1	
Watchmaker	9	6	
Locksmith	7	1	**
Bricklayer	8	1	**
Carpenter	17	6	***
Plumber	6	1	**
Plasterer	4	2	
Tiler	5	2	
Cabinet maker	13	4	**
Wood turner	9	2	**
Boat builder	16	2	***
Surf board maker	16	5	***
French polisher	2	1	
Vehicle trimmer	3	1	
Panel beater	8	2	**
Motor mechanic	22	6	***
Cycle mechanic	14	4	***
Aircraft mechanic	22	2	***
Fitter and turner	8	1	***
Tool maker	7	1	**
Welder	7	2	*

OCCUPATIONS	PERCENT "LIKES"		
	M	F	
Sheet metal worker	4	0	**
Boilermaker	3	0	*
Refrigeration mechanic	5	1	*
Typewriter mechanic	3	1	
Electrician	27	4	***
Radio and T.V. tradesman	19	3	***
Optical mechanic	3	3	
Dental mechanic	2	3	
Business machine mechanic	4	1	
Dressmaker	0	20	***
Milliner	0	4	**
Jeweller	9	16	*
Florist	0	11	***
Photographer	23	33	*
Window dresser	3	18	***
Fashion designer	6	31	***
Interior designer	12	33	***
Commercial artist	9	22	***
Industrial designer	14	7	*
Ticket writer	2	7	
Advertising lay-out designer	10	23	***
Textile designer	4	16	***
Actor	10	17	*
Singer	7	16	*
Dancer	2	15	***
Musician	12	13	
Demonstrator	3	6	
Radio/T.V. announcer	16	23	
Disc jockey	18	17	
Film maker	15	17	
Stage designer	7	20	***
T.V. camera operator	20	11	*
Fashion co-ordinator	3	25	***
Make up artist	3	16	***
Model	3	16	***
Beautician	0	20	***
Script writer	13	15	
Journalist	22	21	

OCCUPATIONS	PERCENT "LIKES"		
	M	F	
Forester	37	11	***
Dairy technologist	11	06	
Meat inspector	10	02	***
Stock and station agent	10	03	**
Livestock buyer	11	05	*
Veterinary assistant	15	29	***
Farmer	22	11	**
Orchardist	11	06	
Dairy inspector	8	3	*
Gardener	9	12	
Greenkeeper	9	4	*
Landscape gardener	14	15	
Park ranger	33	12	***
Jackeroo	14	9	
Farm worker	14	8	
Jockey	1	7	**
Stud groom	3	7	
Stable hand	4	6	
Shearer	3	5	
Wool classer	7	5	
Air pilot	44	15	***
Ship's officer	19	4	***
Armed services cadet	9	5	
Soldier	7	3	
Sailor	7	5	
Doctor	18	25	
Pharmacist	22	32	*
Medical technologist	14	28	***
Dietitian	5	28	***
Optometrist	12	17	
Speech therapist	4	26	***
Occupational therapist	8	35	***
Physiotherapist	9	35	***
Chiropodist	3	5	
Orthoptist	2	11	***
Nurse	3	34	***
Dentist	9	10	

OCCUPATIONS	PERCENT "LIKES"		
	M	F	
Children's nurse	0	42	***
Psychiatric nurse	2	16	***
Dental therapist	1	10	***
Radiographer	14	18	
Optical dispenser	2	5	
Nurse's aide	1	12	***
Medical orderly	3	7	
Ambulance officer	5	4	
Biological technician	21	18	
Laboratory technician	22	16	
Animal technician	15	16	
Zoo keeper	15	15	
Textile technician	4	6	
Draftsman	27	12	***
Engineering technician	33	3	***
Cartographer	16	10	
Health inspector	19	8	**
Radio technician	25	05	***
P.M.G. technician	26	03	***
Survey draftsman	31	7	***
Electronics technician	37	2	***
Marine engineer	22	3	***
Radio operator	15	9	
Service station attendant	4	4	
Postman	5	5	
Builder's labourer	10	3	**
Clothing machinist	0	3	**
Rigger	4	1	
Crane driver	3	1	
Fireman	3	2	
Truck driver	9	2	***
Taxi driver	5	6	
Railway worker	3	1	
Miner	3	0	*
Waterside worker	2	0	*
Customs inspector	15	12	
Storeman	3	3	

OCCUPATIONS	PERCENT "LIKES"		
	M	F	
Copy writer	2	7	*
Proof reader	3	6	
Editor	9	10	
Librarian	4	22	***
Publisher	6	7	
Geographer	24	14	*
Town planner	28	16	**
Sociologist	16	21	
Economist	21	9	***
Marketing executive	13	5	**
Market researcher	12	9	
Accountant	34	11	***
Investment analyst	10	3	**
Stockbroker	7	3	
Auctioneer	3	3	
Estate agent	10	6	
Valuer	12	2	***
Actuary	6	5	
Computer programmer	36	27	*
Computer operator	31	25	
Travel agent	14	32	***
Company manager	26	13	***
Bookkeeper	10	6	
Punch-card operator	4	8	
Filing clerk	5	6	
Bank teller	11	14	
Secretary	2	31	***
Typist	1	18	***
Sales representative	8	7	
Shop assistant	3	7	
Executive trainee	17	11	
Postal clerk	5	4	
Business machine operator	5	4	

OCCUPATIONS	PERCENT "LIKES"		
	M	F	
Library clerk	2	13	***
Hotel manager	24	14	*
Advertising trainee	11	13	
Insurance salesman	4	2	
Public Service clerk	22	17	
Cashier	2	4	
Correspondence clerk	3	3	
Local government officer	12	05	*
Motor spare parts salesman	6	3	
Receptionist	1	28	***
Enquiries clerk	3	8	*
Retail buyer	4	8	
Parole officer	4	8	
Welfare officer	10	24	***
Recreation officer	11	15	
Personnel officer	12	17	
Hospital administrator	7	14	*
Solicitor	23	11	**
Barrister	20	13	
High school teacher	45	39	**
Primary teacher	26	60	***
Pre school teacher	7	46	***
Manual arts teacher	21	06	***
Physical education teacher	31	26	
Art teacher	5	14	**
Music teacher	5	9	
Home economics teacher	2	17	***
Needlework teacher	0	15	***
Handicapped children teacher	5	29	***
School counsellor	11	26	***
Social worker	14	35	***
Psychologist	19	31	**
Youth worker	15	29	***

TABLE 2

Frequently and Infrequently "Liked" Occupations from the "Choice of Occupation" form (n=500)

Males	Percent "likes"	Females	Percent "likes"
High School Teacher	45%	Primary Teacher	60%
Air Pilot	44	Pre-School Teacher	46
Electrical Engineer	41	Children's Nurse	42
Surveyor	41	High School Teacher	39
Mechanical Engineer	39	Social Worker	35
Electrical Engineer	39	Occupational Therapist	35
Architect	37	Physiotherapist	35
Forester	37	Nurse	34
Electronics technician	37	Photographer	33
Computer Programmer	36	Interior Designer	33
Accountant	34	Biologist	32
Engineering Technician	33	Pharmacist	32
Park Ranger	33	Travel Agent	32
Physical Education Teacher	31	Psychologist	31
Computer Operator	31	Fashion Designer	31
Survey Draftsman	31	Secretary	31
Aeronautical Engineer	31		
Children's Nurse	0	Miner	0
Clothing machinist	0	Waterside Worker	0
Cleaner	0	Sheet Metal Worker	0
Needlework Teacher	0	Boilermaker	0
Beautician	0		
Florist	0		
Milliner	0		
Dressmaker	0		

TABLE 3

SOME SEX-BALANCED ITEMS FROM THE "CHOICE OF OCCUPATION" FORM

THINGS	PEOPLE	IDEAS	DATA
Orchardist	Recreation Officer	Chemist	Bookkeeper
Gardener	Physical Education Teacher	Biochemist	Bank Teller
Landscape Gardener	Veterinary Scientist	Biologist	Public Service Clerk
Jackeroo	Doctor	Botanist	Biological Technician
Farm Worker	Optometrist	Zoologist	Customs Inspector
Cartogrpher	Dentist	Ecologist	Policeman/Policewoman
Radio Operator		Musician	
Cook		Film Maker	DATA-PEOPLE
Radiographer		Script Writer	Radio/TV Announcer
Laboratory Technician		Journalist	Disc Jockey
Animal Technician		Editor	Estate Agent
Zookeeper		Advertising Trainee	Barrister
Computer Operator		Market Researcher	
		Executive Trainee	
		Personnel Officer	
		Sociologist	
		Agricultural Scientist	
		Wool Technologist	
		Dairy Technologist	

TABLE 4

AVERAGE PROPORTION PREFERENCE FOR WORK-TASKS[1]

SEX	THINGS	IDEAS	PEOPLE	DATA-PEOPLE	DATA
Male	0.106 (0.098)	0.157 (0.091)	0.096 (0.101)	0.124 (0.073)	0.077 (0.181)
Female	0.049 (0.043)	0.153 (0.083)	0.237 (0.237)	0.082 (0.091)	0.112 (0.091)

[1] Standard deviations shown in parentheses

TABLE 5

ANALYSIS OF VARIANCE FOR MALE AND FEMALE OCCUPATIONAL CHOICES

SOURCE	SSQ	df	Var.Est.	F
Sex	0.0216	1	0.0216	F= 2.734 (n.s)
Work-tasks	0.4069	4	0.1017	F=12.873 (p<.01)
Sex x Work-tasks	0.4392	4	0.1098	F=13.89 (p<.01)
Within Cells	3.8303	484	0.0079	